SHURA-BURA, M. R. and YERSHOV, A. P.

"Modern Status of Automatization of Programming"

presented at the All-Union Conference on Computational Mathematics and Computational Techniques, Moscow, 16-28 November 1961

So: Problemy kibernetiki, Issue 5, 1961, pp 289-294

41191

S/191/62/000/007/003/160
D222/D309

9.7100

AUTHORS: Trifonov, N.P., and Shura-Bura, M.R.

TITLE: Properties of the programming program for Strela-4

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika, no. 7, 1962, abstract 7-1-16 m (In collection: Sistema avtomatiz. programmirovaniya, M., Fizmatgiz, 1961, 71 - 84)

TEXT: The basic ideas in the design and structure of the programming program written at the Vychislitel'nyy tsentr MGU (Computer Center, MGU) are described. The basis of this programming program (PP) is the method of standard subschemes. A standard sub-scheme is a part of the logical scheme (LS) realizing a certain algorithm and permitting of a standard description independently of the problem in which the given algorithm is realized (e.g. cycles). The standard subschemes are described in a symbolic notation and they are transcribed by special blocks of the PP into a complete LS in terms of the basic types of operators used in this PP. This accomplishes

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Properties of the programming ...

an intermediate stage of programming. Standard subschemes of various levels can be used, and correspondingly the programming can be organized with several intermediate stages. The initial information for PP is LS, a table (T) showing the dependence of quantities on the parameters, and some general information. Six types of operators are permitted in LS: A - arithmetical, O - restoration, F - address modification, Ф - forming, N - nonstandard, DK - auxiliary constants. In LS the use of standard subschemes f is permitted. A short description of these operators is given. The initial information for A is given in the form of a system of formulas $f_1(x_1, x_2, \ldots, x_k) \Rightarrow \Rightarrow x_j$. The table T showing the dependence of the quantities on the parameters contains the parameters of the program and the accompanying information on the modification of the corresponding addresses when the parameters are changed by unity. The general information contains a table of symbolic addresses, a table of external addresses, a table of intervals and a table of storage allocation. The last of these serves for the processing of a given program with the standard-component program ССП-2 (SSP-2). The system of information coding is given - i.e. the distribution of symbolic

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Properties of the programming ...

numbers in PP - and also the symbolic numbers for coding the operators and the corresponding indicators. In order to prepare the initial information for input there is an auxiliary program for preliminary processing. The PP consists of the following blocks: B - input, f - standard subschemes, C - auxiliary block (to form short LS's), B - processing of nonstandard operators, A - arithmetics, E - working-cell economy block. O, F and Φ are blocks for restoration, address modification and forming, RP is a block for ordering and the assignment of addresses. All blocks of PP are written on magnetic tape and are brought sequentially into the operative memory of the computer. [Abstracter's note: Complete translation.]

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S/030/62/000/002/006/008
B105/B110

AUTHOR: Shura-Bura, M. R., Doctor of Physics and Mathematics

TITLE: Conference on automatic programming

PERIODICAL: Akademiya nauk SSSR. Vestnik, no. 2, 1962, 92 - 93

TEXT: From 5 - 15 September, 1961 a conference on automatic programming had been convened in Warsaw by the Polish Academy of Sciences. It was attended by representatives of Hungary, the German Democratic Republic, Poland, Roumania, the USSR, and Czechoslovakia. Two lectures dealt with the research trends in the USSR (V. M. Glushkov, V. M. Kurochkin) and in Czechoslovakia (K. Gulik, Kral). Programming in the language "Sako" which had been developed under the direction of L. Lukaszewicz at the Institute for Mathematical Machines of the Polish Academy of Sciences from 1959 - 1960 serves as the basis of automation for the machines XYZ and ZAM-2. The advantage of the language "Sako" consists in that the form of feeding does not depend on the machine used and on the special features of the program. Thus "Sako" is equivalent to the international "Algol". "Sako" is a universal language for the automation of programming for computers with low

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Conference on automatic ...

capacities (operative memory of 500 to 1000 words, velocity 500 - 1000 operations per second). At the Institute of Mathematical Machines L. Kalmar (Hungary) recommended that a table of square roots of the numbers 1 to 10 should be constructed, V. M. Kurochkin (USSR) recommended a table of values of the highest root of the cubic equation $x^3 - 2x^2 - Ax + 1 = 0$ as a function of the parameter A for the range $0 \leqslant A \leqslant 1$. L. Kalmar and G. Frey (Hungary) spoke about the programming of the machine M-3. M. P. Shura-Bura (USSR) spoke about the use of the language "Algol". S. L. Sobolev (USSR) spoke about automation of programming in the Sibirskoye otdeleniye Akademii nauk SSSR (Siberian Department of the Academy of Sciences USSR). Z. Pawlak (Poland) spoke about addressless machines. It was decided that annual conferences of this kind should be convened and that a permanent committee on automatic programming should be established in the Socialist countries. This task was assigned to the Polish Academy of Sciences.

Card 2/2

9.7000

S/208/62/002/002/008/014
D234/D301

AUTHORS: Sobel'man V.I. and Shura-Bura M.R. (Moscow)

TITLE: Realization of recursive procedures in the language ALGOL-60

PERIODICAL: Zhurnal vychislitel'noy matematiki i matematicheskoy fiziki, v. 2, no. 2, 1962, 303 - 316

TEXT: The authors describe a method of realizing recursive procedures free from the defect of doubling and correcting that occured in the method offered by Irons and Feurzeig; procedures offered by these are stated to be used in the present method as far as possible. Existence of a special program in the computer is required. Measures are taken for diminishing losses due to additional use of memory and to the delay caused by the work of the special program. There are 5 figures and 2 non-Soviet-bloc references. The references to the English-language publication read as follows: P.Z. Ingerman, Communs ACM, 1961, 4(1), 55 - 59; E.T. Irons, W. Feurzeig, Communs ACM, 1961, 4(1) 65 - 69

SUBMITTED: December 16, 1961

√B

Card 1/1

KRINITSKIY, N.A.; MIRONOV, G.A.; FROLOV, G.D.; LYUSTERNIK, L.A., red.; YANPOL'SKIY, A.R., red.; SHURA-BURA, M.R., red.; BEZBORODOV, Yu.M., red.; MURASHOVA, N.Ya., tekhn. red.

[Programming] Programmirovanie. Moskva, Fizmatgiz, 1963. 383 p. (MIRA 16:8)
(Programming (Electronic computers))

ACCESSION NR: AP4012006 S/0208/64/004/001/0096/0112

AUTHORS: Shura-Bura, M. R. (Moscow); Lyubimskiy, E. Z. (Moscow)

TITLE: Translator for Algol-60

SOURCE: Zhurnal vy*chisl. matem. i matem. fiz., v. 4, no. 1, 1964, 96-112

TOPIC TAGS: translator, input language, computer, function identifier, teletype symbol, Latin letter, meta linguistic formula, magnetic tape, translator TA 2, Algol 60

ABSTRACT: The basic features and the input language used by the translator TA-2, built to exploit computers for translating purposes, are presented. Three constraints are put on Algol-60. These are: 1) labels or signs can be used only as identifiers; 2) the array "own" must have constant cutoff pairs; 3) standard function identifiers may not be actual parameters. It is shown that this input language can be universal (making possible the formal exchange operation concepts) and that it is a refinement of Algol-60 procedure-code. The input alphabet is based on teletype symbols containing 26 lower case Latin letters, a set of special signs, and a "stress" sign. In addition, it contains lower case Greek letters and

ACCESSION NR: AP4012006

elementary function notations. The program assignment for TA-2 consists of a meta-linguistic formula < program > :: = < operator > ; | < preliminary commentary for execution > ; < operator > . The translator is organized into blocks which operate one after another and are produced on magnetic tapes once only. Each block can be treated independently of the others. A detailed breakdown is given for the input language, including three constraints, the alteration (which in turn includes identifiers such as "sld," "oft," "moz," "mzu," and a commentary), array "own" description which contains a detailed syntax and a note on semantics, the procedure description with several examples, the exchange procedure (including machine-machine and language-machine operations), and the mathematical address system. A short explanation is also given of the operation scheme of the TA-2 which consists of Algol-60 recording input, the recoding process using 15 binary digits, the syntax control block, and the information input for the internal language of the translator. The translator has 20 000 machine words, 3000 of which are tabular in form. It includes 21 zones of magnetic tapes and uses the standard IS-2 program. The TA-2 is a development of the original type TA-1, started in 1961. It was completed in June 1963. I. B. Zady*khaylo, I. Kh. Zusman, S. S. Kamy*nin, D. A. Koryagin, E. S. Lukhovitskaya, V. V. Lutsikovich, V. V. Marty*nyuk, G. M. Oleynik-Ovod, V. A. Semyachkin, V. I. Sobel'man, and L. V. Ukhov took part in producing the

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ACCESSION NR: AP4012006

translator TA-2 and in developing the programming procedures.

ASSOCIATION: none

SUBMITTED: 010ct63 DATE ACQ: 14Feb64 ENCL: 00

SUB CODE: DP NO REF SOV: 000 OTHER: 001

Card 3/3

SHURA-BURA, M.R. (Moskva); MARTYNYUK, V.V. (Moskva)

Efficient organization of the dynamic use of memory systems.
Zhur. vych. mat. i mat. fiz. 4 no.5:963-967 S-O '64.
(MIRA 17:12)

ACCESSION NR: AP4045720 S/0208/64/004/005/0963/0967

AUTHORS: Shura-Bura, M. R. (Moscow); Marty*nyuk, V. V. (Moscow)

TITLE: On the effective organization of the dynamic use of memory

SOURCE: Zhurnal vy*chislitel'noy matematiki i matematicheskoy fiziki, v. 4, no. 5, 1964, 963-967

TOPIC TAGS: memory core, cybernetics, computer, digital computer, memory address

ABSTRACT: The authors describe a machine operation which allows the dynamic transfer of information into operating memory in the time of 3 to 4 elementary logical operations, thus gaining significant savings in computation time for long problems. The hardware configuration needed is a triply-addressed machine with 9 bit operation codes and 12 bit addresses. In addition, the authors propose a mathematical address consisting of 19 bits. Of these, 7 are alloted for a memory pack, 5 for a memory "page", and 7 for a code number. In operational memory, scales are stored in successive cells containing all indices of mathematical addresses which can be used for computation. Each scale has 32 bits numbered from 0 to 31, each of which corresponds to a page from a memory pack. From the scale the address of the given code is found in operational memory, or, if the memory page is not in the

Card 1/2

L 36829-66 EWT(d)/EWP(1) IJP(c) GG/BB

ACC NR: AP6017929 SOURCE CODE: UR/0378/66/000/002/0057/0102

AUTHOR: Korolev, M. A.; Kuz'min K. S.; Lavrov, S. S.; Letichevskiy, A. A.; Stolyarov, G. K.; Shura-Bura, M. R.

ORG: None

TITLE: Report on the ALGEK algorithmic language

SOURCE: Kibernetika, no. 2, 1966, 57-102

TOPIC TAGS: algorithmic language, economics, information processing, computer application, machine translation

ABSTRACT: This paper presents a description of an algorithmic language termed ALGEK (algorithmic language for economic problems). It extensively uses the data on the ALGOL-60 language, the SUBSET ALGOL-60 (IFIP) language, and the input-output procedures developed for ALGOL. The present work also makes use of the ideas of COBOL-60 language and the input-output procedures developed elsewhere (D. E. Knuth, L. L. Bumgarner, P. Z. Ingerman, J. H. Werner, D. E. Hamilton, M. P. Lietzke, D. T. Ross, A Proposal for Input — Output Conventions in Algol-60 (A Report of the Subcommittee on ALGOL of the ACM Programming Languages Committee). Communications of the ACM, V.7, N 5, May 1964.) The proposed language may be utilized for the composition of pro-

Card 1/2 UDC: 681.142.001:330.115

grams for some typical problems in the processing of economic information and makes it possible to start the development of translators. The preliminary versions of the language were discussed at several conferences and seminars. The draft of the language was sent out to several organizations. The present publication has been approved by the Group of Algorithmic Languages for Processing Economic Information attached to the Commission for Multilateral Cooperation Between Academies of Sciences of Socialist Countries on the Problem of "Scientific Problems in Computing Technology" (Gruppa algoritmicheskikh yazykov po pererabotke ekonomicheskoy informatsii (GAYaPEY) pri komissii mnogostoronnego sotrudnichestva mezhdu akademiyami nauk sotsialisticheskikh stran po probleme "Nauchnyye voprosy vycheslitel'noy tekhniki") and is being recommended for a description of economic problems and for the creation of translators in the cooperating countries. GAYaPEY recommends that the authors of the language perform work on the creation of an input-output apparatus and retains the right to insert corrections into the language. The following are treated in great detail: the structure of the language; fundamental symbols, identifiers, digits, quotations, and fundamental concepts; expressions; and operators. Comrades Yu. Ya. Bazilevskiy, M. N. Yefimova, and A. S. Frolov rendered a great deal of assistance in the work, and the authors express their gratitude to them. Orig. art. has: 9 tables and 3 figures.

SUB CODE: 05/ SUBM DATE: 04Dec65/ ORIG REF: 000/ OTH REF: 007

SHURA-BURA, N.A.

Chronaxymetric data on the central nervous system in peptic ulcer. Trudy LSGMI 20:42-54 '54. (MLRA 10:8)

1. Kafedra Normal'noy fiziologii Leningradskogo sanitarno-gigiyenicheskogo meditsinskogo instituta, zav. kafedroy - prof. Yu.M.Uflyand i Kafedra Propedevtiki vnutrennikh bolezney Leningradskogo sanitarno-gigiyenicheskogo meditsinskogo instituta, zav. kafedroy - prof. S.M. Ryss.

(PEPTIC ULCER, physiology,
CNS, chronaxy)
(CENTRAL NERVOUS SYSTEM, in various diseases,
peptic ulcer, chronaxy)

SHURA-BURA, N.A.

USSR/Human and Animal Physiology - The Nervous System. V-8

Abs Jour : Ref Zhur - Biol., No 4, 1958, 18512

Author : N.A. Shura-Bura

Inst : The Leningrad Medical Institute of Sanitation and Hygiene and The National Institute of Childhood Orthopedics.

Title : A Critique of the Ideas of Lapique on Isochronia and Heterochronia.

Orig Pub : Tr. Leningr. san.-gigien. med. in-ta i n.-i. detsk, ortoped. in-ta, 1956, 29, 105-113

Abstract : Rheobase and chronaxie of a nerve (in the region of the sciatic plexus) and of the flexor and extensor muscles of the knee and foot were measured in a frog with brain and spinal cord destroyed. Functional changes in the neuromuscular apparatus were produced by the action of a 3% and a 0.0065% solution of NaCl, by a 2% KCl solution, and also

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USSR/Human and Animal Physiology - The Nervous System.

Abs Jour : Ref Zhur - Biol., No 4, 1958, 18512

by stretching the muscles and applying pressure to the nerve. The conduction of excitation from nerve to muscle was not disturbed even with a very considerable increase in the coefficient of heterochronia, in certain cases up to 25 and even up to 33.3. In the presence of a high rheobase, conductivity could be disturbed, and also with a low coefficient of heterochronia. The coefficient of excitability" (the relationship of the rheobase of muscle and nerve) is a better reflection of the conditions of conductivity. If this coefficient is less than one or more than 10, conductivity is usually disturbed. These data contradict the teaching of Lapique on stable isochronia as a condition of conductivity and are in agreement with A.A. Ukhtomskiy's idea of a dynamic isochronia, which is created in the very process of activity.

Card 2/2

USSR/Human and Animal Physiology. The Nervous System. V

Abs Jour: Ref. Zhur-Biol., No 6, 1958, 27327.

Author : N.A. Shura-Bura.
Inst : The Leningrad Medical Institute of Sanitation and Hygiene and the National Institute of Childhood Orthopedics.

Title : The Possibility of Antidromic Influences of Motor Nerves on Spinal Reflexes.

Orig Pub: Tr. Leningr. san.-gigien. med. in-ta i N.-i.detsk. ortoped. in-ta, 1956, 29, 148-153.

Abstract: Deafferentation was performed in frogs in the region of posterior roots VII, VIII and IX; on the same side the sciatic nerve was transected and myographic recordings were made of the reflex contractions of the semitendinosus muscle of the opposite side in

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SHURA-BURA, N.A.

USSR/Human and Animal Physiology - The Nervous System. V-8

Abs Jour : Ref Zhur - Biol., No 4, 1958, 18513

Author : N.A. Shura-Bura

Inst : The Leningrad Medical Institute of Sanitation and Hygiene and The National Institute of Childhood Orthopedics.

Title : The Significance of the Central Nervous System for Isochronia of Nerve and Muscle.

Orig Pub : Tr. Leningr. san.-gigien. med. in-ta i n.-i. detsk. ortoped. in-ta, 1956, 29, 289-294

Abstract : A comparison was made of the changes in the coefficient of heterochronia and the coefficient of excitability between muscles (triceps femoris and gastrocnemius) and nerve (the sciatic) under the influence of a 3% NaCl solution in thalamic frogs with central nervous system destroyed. The presence of central subordination prevents a phase of sudden

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USSR/Human and Animal Physiology - The Nervous System.

Abs Jour : Ref Zhur - Biol., No 4, 1958, 18513

increase in heterochronia, characteristic for the development of the effect of NaCl, and limits the increase in the coefficient of excitability.

Card 2/2

SHURA-BURA, V.L., polkovnik meditsinskoy sluzhby, professor

Use of sea water for disinfection. Voen.-med. zhur. no.3:55-57 Mr '56. (MLRA 9:9)
(SEA WATER--PHYSIOLOGICAL EFFECT)
(DISINFECTION AND DISINFECTANTS)

SHURAGIN, A.A., dotsent, kandidat fiziko-matematicheskikh nauk.

Thermal stresses in cylinders according to temperature dependent solidification principles. Sbor.st.Ural. politekh.inst. no.47:8-27 '53. (MLRA 8:1)
(Steel ingots) (Plasticity) (Strains and stresses)

SHURAGIN, A. G.

21

Electron oscillograph apparatus for the study of electrode processes. F. F. Fazlullin, A. G. Shuragin, and E. D. Kochman (V. I. Ul'yanov-Lenin State Univ., Kazan). *Zhur. Fiz. Khim.* 31, 1640–2(1957).—An oscillographic app. was described for the observation and photographing of anodic and cathodic charging curves, and was a modification of the Hickling app. (*C.A.* 39, 5185[3]). The app. permits a wide range of regulation of the current strength and polarization time. W. M. Steruberg

5

1/1

SHURAK, L.M.; RYBALKO, I.A.; BOROVITSKIY, Ye.V.

Production of cementless slag concrete blocks. Stroi. mat. 9 no.6:20-21 Je '63. (MIRA 17:8)

1. Glavnyy inzh. Donetskogo zavoda stroitel'nykh materialov (for Shurak). 2. Nachal'nik laboratorii i otdela tekhnicheskogo kontrolya Donetskogo zavoda stroitel'nykh materialov (for Rybalko). 3. Glavnyy mekhanik Donetskogo zavoda stroitel'nykh materialov (for Borovitskiy).

SOV/23-58-3-5/11

AUTHORS: Fayngol'd, S.I., Candidate of Technical Sciences; Stoler, I.G., Shurak, R.D.

TITLE: On the Consumption of Zinc Chloride at the Catalytic Treatment of Oil Shale Tar ((O Raskhode khloristogo tsinka pri kataliticheskoy pererabotke slantsevoy smoly)

PERIODICAL: Izvestiya Akademii nauk Estonskoy SSR, 1958, Nr 3, pp 208 - 219 (USSR) (Seriya tekhnicheskikh i fiziko-matematicheskikh nauk)

ABSTRACT: The article deals with test results on the influence of the quantity of zinc chloride used as the basic catalyst in the catalytic treatment of oil shale tar by the method of the Chemical Institute of the AS Estonian SSR. Since 10% of zinc chloride was used in the raw material in former tests, the possibility of diminishing this amount is considered. The raw material consisted of a mixture of industrial tar fractions from tunnel-oven light oil and oven benzine. The raw material was heated, together with the catalyst, at 100° C up to a drop of the bromine number to 60 - 62, followed by a separation of the formed complex from the catalysate and a distillation of the catalysate into benzine, a fraction of Diesel fuel, a fraction of sewing oil and a residue of vacuum distillation. An increase of the concentration of zinc

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chloride resulted in a shortening of the process, and in an improvement in the quality of the refined products. An increase of the catalyst concentration to 15 to 20% permits the catalyst to be used four times, resulting in a 3.75 to 4% decrease in the total consumption of the catalyst. The most economical way of carrying out the process of zinc-chloride refining, is the use of a 10 to 15% catalyst, and its repeated use with an addition of 2% of fresh catalyst before every subsequent cycle. The quality of the obtained products is satisfactory. The consumption of the zinc chloride, before its regeneration, is reduced by up to 3%. The exhausted catalyst is extracted in the form of an aqueous solution of zinc chloride amounting to 55% of the original

On the Consumption of Zinc Chloride at the Catalytic Treatment of Oil Shale Tar

amount. The total consumption of zinc chloride amounts to 1 to 1.5% of the raw material. There are 13 tables and 6 Soviet references.

ASSOCIATION: Institut khimii AN Estonskoy SSR (The Chemistry Institute of the AS Estonian SSR). Proyektnyy i nauchno-issledovatel'skiy institut Ministerstva mestnoy i slantse_khimicheskoy promyshlennosti Estonskoy SSR (The Planning and Scientific Research Institute of the Ministry of the Local Oil-Shale Chemical Industry of the Estonian SSR)

SUBMITTED: August 3, 1957

NOTE: Russian title and Russian names of individuals and institutions appearing in this article have been used in the transliteration

1. Tars---Catalysis 2. Zinc chloride---Catalytic properties
3. Petroleum---Production 4. Zinc chloride---Consumption

SHURAKOV, F.V., kand. sel'khoz. nauk; MOSKALENKO, K.M., tekhnik; MOSTOLOVITSA, K.Yu., tekhnik; IONOVA, M.A., kand. sel'khoz. nauk; TOLKACHEV, V.P., nauchn. sotr.; ORLOV, G.K., tekhnik; SOLOV'YEVA, T.F., tekhnik; ZHILYAKOVA, O., red.izd-va; GLIKMAN, N., red. izd-va; ISUPOVA, N., tekhn. red.

[Catalog of fruit crop varieties of the All-Union Scientific Research Institute of Plant Growing in the Crimea] Katalog sortov plodovykh kul'tur Vsesoiuznogo nauchno-issledovatel'skogo instituta rastenievodstva v Krymu. Simferopol', Krymizdat, 1960. 230 p. (MIRA 17:1)

1. Leningrad. Vsesoyuznyy institut rasteniyevodstva. Krymskiy pomologicheskiy rassadnik.
(Crimea--Fruit--Varieties)

SHURAKOV, M.M.; TYURIN, N.N.

Stamping panels of magnesium alloys. Av.prom. 26 no.8:94-95 Ag '57. (MIRA 15:4)
(Forging)

SANFIROVA, T.P.; TOMASHEVSKIY, E.Ye.; SHURAKOV, S.A.

Time dependence of the strength of aluminum and silver at low temperatures. Fiz. tver. tela 5 no.6:1700-1705 Je '63. (MIRA 16:7)

1. Fiziko-tekhnicheskiy institut imeni A.F. Ioffe AN SSSR, Leningrad.

FD 375

USSR/Physics - Steel, Mechanical Properties

Card 1/1

Author : Shurakov, S. S.

Title : Delayed failure of hardened steel

Periodical : Zhur. tekh. fiz. 24, 527-536, Mar 1954

Abstract : Investigates decrease in strength of hardened steel under action of static load, explaining this phenomenon by processes of plastic deformation occurring in individual favorably oriented grains under stresses lower than regular "transitory" strength. Concludes that development of plastic deformation, with certain time elapsed, leads to overloading and deterioration of the boundaries of initial austenite grains. Five references, 4 USSR, one 1940, others 1947-1949. Photomicrographs, diagrams, illustrations.

Institution :

Submitted : July 20, 1953

SHURAKOV, S. S.

Influence of rest on the strength of quenched steel and its tendency towards retarded failure. S. S. Shurakov. *Fiz. Metal. i Metalloved., Akad. Nauk S.S.S.R., Otd. Fiziol.* 2, No. 1, 66–77(1956).—Some of the 3 × 10 × 80-mm. plates made of structural Ni-Cr steel with 0–3% C were carburized to 1% C and all were quenched from 1175° in a 25% soln. of KOH or from 800° in oil. After a rest period of 45 sec. to 10 days, the plates were tested for bending strength. In a 2nd series, quenched bar samples of uncarburized steel were torsion tested. An increase of C content from 0.3 to 1% raised the tensile strength from 22.5 to 24.0 kg./sq. mm., or by 52% during the first 2 hrs. of rest, and then has no effect, while the 0.3% C steel continued to become stronger for 10 days, from 10.0 to 24.6 kg./sq. mm., i.e. by 145% when both were quenched from 1170°. No change in strength was noted on 800°-quenched samples in the course of time. An examn. of broken samples under a microscope indicated that the no. of slips near the fracture increases with the time of rest. The mechanism of fracturing after a 1-day rest is different from that noted after a 10-day rest. In the first case, a no. of cracks are seen in the zone of fracture and the destruction starts with the formation of a group of slips, where the fracture generates. After a 10-day rest, plastic deformation proceeds not in the localized areas but all over the body of the metal. Cracking follows grain boundaries of the original austenite as well as passes through the grains. Retarded failure, i.e. capability of supporting a given load before failure for some time, was observed after both quenching treatments, being more pronounced with carburized samples.

I. D. Gat

SHURAKOV, S.S., kandidat tekhnicheskikh nauk.

Effect of the deformation rate on the plasticity of tempered steel. Metalloved. i obr. met. no.10:57-63 O '56. (MLRA 9:11)

1. TSentral'nyy nauchno-issledovatel(skiy institut Ministerstva sudostroitel'noy promyshlennosti.
(Steel--Testing) (Deformations (Mechanics)).

SOV/124-58-5-6126

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 5, p 156 (USSR)

AUTHOR: Shurakov, S.S.

TITLE: Strength of Hardened Steel as Affected by Load Duration (Zavisimost' prochnosti zakalennoy stali ot vremeni deystviya nagruzki)

PERIODICAL: V sb.: Metallovedeniye. Leningrad, Sudpromgiz, 1957, pp 100-126

ABSTRACT: Experimental results investigating the so-called "delayed failure" are described, when the specimen under stresses lower than the conventional ultimate-strength value (short-duration ultimate strength) fails some time after the start of the load application. It has been discovered that low anneal has the effect of suddenly lowering (to a fraction of the original) the ultimate strength for quench-hardened steel after low anneal. The effect becomes less pronounced on recovery after quenching and on annealing at higher temperatures. Hypothesis is made as to the physical nature of the phenomenon. Some data are presented concerning the effects of the rate of load application upon the magnitude of residual deformations under flexure and torsion. I.K. Snitko

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1. Steel--Mechanical properties 2. Steel--Failure 3. Steel --Heat treatment

SHURAKOV, S.S

32-6-23/54

AUTHOR: SHURAKOV,S.S.

TITLE: Method of Estimating the Inclination of Steel towards Slow Destruction. (O laboratornykh metodakh otsenki sklonnosti stali k zamedlennomu razrusheniyu, Russian)

PERIODICAL: Zavodskaya Laboratoriya, 1957, Vol 23, Nr 6, pp 707 - 711 (U.S.S.R.)

ABSTRACT: The steel products to be investigated are subjected to stresses (fraction and torsion) at a temperature of from 1 - 9° (room temperature). The lower the stress the later will destruction set in. Test results are shown in form of a diagram "time of stress before destruction".

A) The influence exercised by the interval between the moment of hardening and the beginning of the investigation of the steel products. In the diagram the position of the curves representing strength and time becomes more and more horizontal. After a long period of rest the effect of the decrease of strength may gradually disappear. The effect produced by torsion on "3OXHZA" steel with a medium carbon content at 1170° in alkali (lye). After 3 days of stress strength is reduced by an average of 77 %, whereas in the case of a longer period of rest it is reduced by 12 %. If the carbon content of the steel is greater, the aforementioned development is less pronounced. It is therefore important to

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Card

... steels ... normal stress to ... in laboratories with respect to slowed ... is necessary to use cut samples, and for the ...ittle steel to use smooth samples.

Method of Estimating the Inclination of Steel towards Slow Destruction. 32-6-23/54

ASSOCIATION: Not given
PRESENTED BY:
SUBMITTED:
AVAILABLE: Library of Congress

Card 3/3

Khrenkov, S.S.

25(1) PHASE I BOOK EXPLOITATION SOV/2050

Svarka sbornik statey. (Vyp.) 1 (Welding; Collection of Articles, No 1) Leningrad, Sudpromgiz, 1958. 246 p. 4,000 copies printed.

Resp. Ed.: G. I. Kapyrin, Candidate of Technical Sciences; Ed.: I. A. Zhirmunskaya; Tech. Ed.: K. M. Volchok.

PURPOSE: This collection of articles is intended for use in research institutes, institutes of higher learning, design offices, and plants.

COVERAGE: These technical papers deal with the results of research in welding technology. The main purpose of this work was to investigate the effects of various welding regimes and heat treatments on the mechanical properties of welds of austenitic and perlitic composition. A number of experiments also dealt with the welding properties and weldability of titanium-base alloys and a number of nonferrous metals. One of the objects of the research was to establish the relationship between the geometry of the weld seam and its physical properties. The crystallization of the weld, its mechanical properties, and the various factors affecting the grain structure of the metal were studied by a number of scientists. Of special practical interest is the study of the behavior of a welded structure in which the elasticity of the material and of the welded joint are not within the same range. These considerations lead to experiments with mechanically induced changes in the properties of the weld seam. Another problem which presents many difficulties in welding is the behavior and changes in the heat-affected zone next to the welded joint. One of the papers deals with experiments in this field. A description is given of the equipment and the technique used in electroslag welding, which is regarded as one of the major advances in modern welding technology. Several papers deal with welding techniques of nonferrous alloys and with the use of special fluxes for this work. Most of the papers are profusely illustrated with graphs, diagrams, and photographs. References are given after each article.

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Welding (Cont.) SOV/2050

Shurakov, S.S., Candidate of Technical Sciences; I.V. Goryndi; and Pre-Minor, Engineer. Determination of Properties of the Heat-Affected Zone of Constructional Steels 144

Chachulin, B.B., Candidate of Technical Sciences, and V.I. Syrshchikov, Engineer. Study of Fatigue Strength of Welded Titanium Joints 156

Goryachev, A.P., Engineer, and S.M. Yegorov. Study of Weldability of Certain Titanium Alloys 166

Buryak, I.V., Engineer. AB-AE-1 Electrodes for Manual Welding of Aluminum-Magnesium Alloys 175

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Card 5/6

Shurakov, S. S.

18(7) PHASE I BOOK EXPLOITATION SOV/1838

Metallovedeniye; sbornik statey, [vyp.] 2 (Study of Metals; Collection of Articles, [Nr] 2) [Leningrad] Sudpromgiz, 1958. 265 p. 4,000 copies printed.

Resp. Ed.: G.I. Kapyrin, Candidate of Technical Sciences; Ed.: Ye. A. Kragova; Tech. Ed.: K.M. Volchok.

PURPOSE: This book is intended for metallurgists and metallurgical engineers.

COVERAGE: This is the second volume of collected scientific papers dealing with various problems in physical metallurgy, particularly in mechanical metallurgy and metallography. Topics covered include hydrogen embrittlement, intragranular distribution of elements in alloys, effect of tempering on carbon redistribution, use of tritium to investigate certain phenomena in metals, effect of certain alloying elements on temper brittleness and hardenability of steel, strength of notched specimens of brittle steel, effect of strain hardening on the properties of an aluminum alloy, etc. The articles are concerned mainly with various types of steel, though some deal with nonferrous alloys.

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Shurakov, S.S., Candidate of Technical Sciences. The Role of Surface-active Elements in the Delayed Failure of Hardened Steel 209
A study was made of the tendency of hardened steel to delayed failure
in the presence and virtual absence of traces of quenching oil,
atmospheric moisture, and hydrogen dissolved in the steel. In the
first two cases no difference was detected in strength under static
loads, nor any change in the rate of decrease in strength with time.
A sharp decrease in hydrogen content resulted in an increase in
strength under static loads, but the rate of decrease in strength with
time did not diminish but actually accelerated. The tests were
carried out with all substances which might be surface-active.
Results indicated that the action of these substances does not cause
delayed failure of hardened steel. In the author's opinion, the

Shurakov, S.S. Effect of Temperature on Recovery and Plasticity of Hardened Steel 220
As a result of tests made on two hardened metals (type-12Kh2NVA
steel and a low-carbon chrome alloy), a determination was made of
the dependence of plasticity on (1) the temperature at which
recovery takes place and (2) the duration of recovery. In addition,
the energy required to activate the recovery process (9,000 cal/g-at)
was determined. It was shown that, in spite of the agreement of this
figure with that for the energy required to activate the diffusion of
hydrogen in alpha iron, the recovery phenomenon is not linked with
ordinary amounts of hydrogen.

SHURAKOV, S.S., kand.tekhn.nauk; GORYNIN, I.V.; BLINOV, N.A., inzh.

Evaluating the properties of the heat-affected zone in structural steels. Svarka 1:144-155 '58. (MIRA 12:8)
(Steel, Structural--Welding) (Welding--Testing)

SHURAKOV, S.S., kand.tekhn.nauk

Role of surface-active substances in the phenomena of delayed fracture of hardened steel. Metallovedenie 2:209-219 '58.
(MIRA 13:9)

(Surface-active agents) (Steel--Testing)

SHURAKOV, S. S., kand. tekhn. nauk

Effect of temperature on the recovery and plasticity of hardened steel. Metallovedenie 2:220-229 '58. (MIRA 13:9)
(Metals, Effect of temperature on)
(Steel--Testing)

SHURAKOV S. S

PHASE I BOOK EXPLOITATION SOV/3752

Metallovedeniye; sbornik statey, No. 3 (Physical Metallurgy; Collection of Articles, No. 3), Leningrad, Sudpromgiz, 1959. 390 p. 3,200 copies printed.

Ed.: O. I. Kayrin, Candidate of Technical Sciences; Literary and Tech. Ed.: E. I. Doroshenko.

PURPOSE: This collection of articles is intended for scientific personnel at research and educational institutions and industrial plants and also for advanced students.

COVERAGE: The articles report the results of investigations of 1) the effect of various factors on the susceptibility of constructional and heat-resistant steels and titanium alloys to brittle failure at various temperatures under various conditions of loading (long-time, short-time, cyclic, noncyclic) 2) alloying, structure, and condition of alloys as related to their mechanical properties, and 3) corrosion resistance and evaluation of stainless and heat-resistant steels. The articles are accompanied by numerous Soviet and non-Soviet references. No personalities are mentioned.

Zav'yalov, A. S., Doctor of Technical Sciences, Professor. Nature of Steel-Embrittlement Processes During Heating and the Effect of Alloying Elements on Them 3

Teplova, Ye.D., Candidate of Technical Sciences; K. S. Taylor, Engineer; and Ye. A. Mironenko, Technician. Effect of Nickel and Copper on Thermal Brittleness of Chrome-Molybdenum-Vanadium Constructional Steel 39

Morov, L. S., Doctor of Technical Sciences; and T. K. Mingin, Engineer. Mechanism of Hydrogen Embrittlement in Steel 51

Glikman, L. A., Doctor of Technical Sciences, Professor; K. K. Kolpatin, Engineer; V. P. Teodorovich, Candidate of Chemical Sciences; and V. I. Dayrabina, Engineer. Change in Mechanical Properties of Certain Steels Under the Action of Hydrogen at High Temperatures and Pressures 58

Morov, L. S., and Yu. D. Mosin, Engineer. Investigation of the Mechanism of Hydrogen Embrittlement of Titanium and Its Alloys 74

Bakhta, S. I., Candidate of Technical Sciences. Role of Intermediate Structures in the Heat Treatment of Medium-Alloy Constructional Steel 83

Gol'dshteyn, L. Ya., Engineer. Stability of Structures and Properties of Tempered Steel 106

Meschinskiy, A. L., Candidate of Technical Sciences. Microscopic and Macroscopic Cracks in Quench-Hardened Steel 118

Chernyatev, V. I., Engineer. Sensitivity of Titanium and Its Aluminum Alloys to Brittle Failure Under Nonrepetitive Loading 136

Chechulin, B. B., Candidate of Technical Sciences. Investigation of the Relationship Between Size of Specimen and Development of the First Failure Crack in Testing Steel for Mechanical Properties 153

Pashkov, P. O., Doctor of Technical Sciences, Professor. Some Observations on the Strength of Metals as Related to Their Microstructure 166

Shurakov, S. S., Candidate of Technical Sciences. Investigation of the Initial Portions of Stress-Strain Diagrams and Relaxation of Stresses for Quench-Hardened Steel 198

SHURAKOV, S.S., kand.tekhn.nauk.

Investigating the initial stages of deformation diagrams and stress relaxation in hardened steel. Metallovedenie 3:198-213 '59. (MIRA 14:3)

(Steel--Testing) (Creep of metals)

PASHKOV, Petr Osipovich, prof., doktor tekhn.nauk; SHURAKOV, S.S., kand.tekhn.nauk, nauchnyy red.; SHAYKEVICH, I.A., red.; KONTOROVICH, A.I., tekhn.red.

[Metal fracture] Razryv metallov. Leningrad, Gos.soiuznoe izd-vo sudostroit.promyshl., 1960. 242 p. (MIRA 14:3)

(Metals--Fatigue)

S/126/60/010/006/015/022
E193/E483

18 8200

AUTHOR: Shurakov, S.S.

TITLE: Investigation of the Temperature-Time Dependence of Strength of Hardened Steel

PERIODICAL: Fizika metallov i metallovedeniye, 1960, Vol.10, No.6, pp.886-895

TEXT: One of the specific characteristics of hardened steel is its low creep-resistance, the other interesting property of this alloy being that its U.T.S. increases after room-temperature ageing. Studies of these characteristics, carried out by the present author and other Soviet researchers, have been described elsewhere (Ref.1 to 17). The object of the investigation, described in the present paper, was to study the effect of test temperature on the U.T.S. and creep-resistance of hardened and tempered steel 3Kh13 (3Khl3) (0.24% C) and hardened steel 30ХН3А (30KhN3A). In the case of steel 3Kh13, the preliminary heat treatment consisted of oil-quenching from 1200°C, followed by 10 min immersion in liquid nitrogen and 3 h tempering at 120°C. Specimens of steel 30KhN3A (measuring 1.5 x 8 x 80 mm) were carburized at 910°C (in a solid carburizing medium) for a period sufficiently long to ensure

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Investigation of the Temperature-Time Dependence of Strength of Hardened Steel

thorough carburization, after which the specimens were oil-quenched from 800°C and immersed in liquid nitrogen for 10 min. In every case, the mechanical tests (transverse bending test, tensile test and time-to-rupture test) were carried out (or started) 10 min after the completion of the preliminary heat treatment. Steel 3Kh13 was tested at 40, 20, 0, -20 and -196°C. Tests on steel 30KhN3A were carried out at 20 and -196°C. All specimens tested in this manner failed by brittle fracture. The results obtained indicated that with decreasing test temperature, the slope of the stress/time-to-rupture curves rapidly decreased, the curve obtained at -196°C being practically horizontal. Quite unexpected was the effect of temperature on the U.T.S. of steel 3Kh13. In contrast to carburized steel 30KhN3A, the U.T.S. of steel 3Kh13 gradually decreased with decreasing test temperature, although the effect of temperature on the creep properties was the same for both alloys. As a result, the U.T.S. of steel 30Kh13 was found to be 250 kg/mm^2 at 20°C and only 141 kg/mm^2 at -196°C;

Investigation of the Temperature-Time Dependence of Strength of Hardened Steel

at the same time, the stress corresponding to time-to-rupture of 8 h was 135 kg/mm^2 at -196 °C and only 80 kg/mm^2 at 20 °C. This difference between two types of steel persisted even when they were tested after tempering at various temperatures (20 to 600 °C in the case of steel 30KhN3A and 20 to 200 °C in the case of steel 3Kh13). In commenting on the results of the present investigation, the author postulates that different effects of the decrease in the test temperature on the brittle strength of hardened steel are associated with the presence or absence of defects (of the quenching-induced microcracks type) in the tested material. In the former case, the strength of hardened steel increases with decreasing temperature and in the latter, it decreases. Both these effects are compatible with the generally accepted theory according to which fracture must be preceded by a stage during which plastic deformation takes place. When the quenching defects are absent, the slight increase in the brittle strength of steel, studied in the course of the present investigation,

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S/126/60/010/006/015/022
E193/E483

Investigation of the Temperature-Time Dependence of Strength of Hardened Steel

confirms the experimentally established and well-known fact that brittle strength is not appreciably affected by temperature variation. When, however, microcracks do develop in steel during quenching, localized plastic deformation near the ends of such cracks in stressed specimens may lead to the "resolution" of the normal stress's peak. The process of resolution is less likely to occur at low temperatures and it is for this reason that the brittle strength of hardened steel, in which such cracks are present, decreases rapidly with decreasing temperature. Regarding the time-to-rupture characteristics of the alloys studied, the effect of temperature on this property may be explained by taking into account the fact that on prolonged loading, deformation by the mechanism of quasi-viscous flow may take place. The resistance to this mode of deformation rapidly increases at low temperatures; hence the observed decrease in the slope of the stress/time-to-rupture curves. Acknowledgments are made to Ye.K.Markevich and A.I.Kartinin for their assistance in the

Card 4/5

S/126/60/010/006/015/022
E193/E483

Investigation of the Temperature-Time Dependence of Strength of Hardened Steel

experimental part of the work. There are 7 figures, 4 tables and 31 references: 28 Soviet and 3 non-Soviet.

SUBMITTED: April 4, 1960

X

Card 5/5

S/129/61/000/004/008/012
E073/E535

AUTHOR: Shurakov, S. S., Candidate of Technical Sciences

TITLE: Relaxation Phenomena in Quenched Steel

PERIODICAL: Metallovedeniye i termicheskaya obrabotka metallov, 1961, No. 4, pp. 36-39

TEXT: In previous work (Ref. 1) the author introduced the conception of the "tough" and "quasi-tough" states of the grain boundary of quenched steel at room temperatures. This concept enabled elucidating the slow failure or the time dependence of the strength of quenched steel at room temperature and also recovery of quenched steel, i.e. the effect of increase in strength and ductility with the progress of time. It can be assumed that the tough state of the boundaries influences not only the characteristics determined during the process of failure but manifests itself also at stresses below the yield point. The work described in this paper was carried out for the purpose of verifying experimentally this latter assumption. Ye. K. Markevich and A. I. Kartinin participated in the experiments. The tests were carried out on steel 12Kh2N4A (12Kh2N4A). For the tensile tests 6 mm diameter specimens were used after quenching from 1150°C in a

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12% solution of potassium hydrate. Ten specimens were tested, five - 30 min after quenching and another five - 5 days after quenching. First, stretching to obtain a deformation of 0.8% was carried out using a Martens mirror instrument; following that, the specimen was deformed until failure. It was found that the average value of the relative contraction increased from 31.7% 30 min after quenching to 54.5% five days after quenching. Torsion tests were carried out on 4 mm diameter specimens with a gauge length of 30 mm, using the strain gauge of P. V. Melent'yev (Ref.2), which is stated to be twenty times more accurate than a mirror instrument. The obtained results indicate that the average value of the modulus of elasticity increased from 7760 kg/mm^2 for "freshly quenched" specimens to 8160 kg/mm^2 for "recovered" specimens. The modulus of elasticity was also determined by radio methods at 20 C using a TsNIITMASh test-rig; no change in the modulus could be established with the progress of time, although the accuracy of the instrument is given as $\pm$ 0.2%. The actual values obtained for one of the specimens were 19970, 20000, 20000, 19970, 20000, 20000 after 15 min, 2 hours, 5 hours, 1 day, 3 days and 5 days from the time of

Relaxation Phenomena .....

quenching, respectively. Stress relaxation tests were made at 20°C and at -196°C. Comparison of the initial sections of the deformation diagrams, Figs. 1 and 2, with the stress relaxation curves, Fig.3, leads to the conclusion that the observed difference in the data for freshly quenched and for rested specimens is due to the pronounced effect of the imperfect elasticity in the specimens of the first group. The experimental results are explained as follows: immediately after quenching the disturbance of the atom-crystalline structure at the boundaries is highest and the resistance to slip is lowest. Therefore, in the case of slow loading of the specimen, the influence of tough deformation at the boundaries on the total deformation of the specimen is considerable and this determines the flat shape of the deformation curve. After resting, the degree of the order of the boundary structure increases and, therefore, the resistance to slip at the boundary increases owing to the fact that the deformation curve becomes steeper. The increase in the modulus of elasticity as a result of "recovery", which could be detected by static tests, cannot be detected by radio methods; this is attributed to the fact that in the latter case tough deformation on the boundaries is excluded

owing to the high speed of deformation. "Freshly quenched" specimens (Fig.3) have a lower relaxation stability than specimens that are "recovered" due to the high intensity of the stress relaxation at the grain boundaries. In applying high temperature tempering, the causes are eliminated which bring about tough behaviour of the boundaries, this corresponds to a sharp increase in their resistance to slip, which leads to high relaxation stability. Cessation of stress relaxation on changing over from tests at 20°C to tests at -196°C (Fig.4) is attributed to the exclusion of tough deformation at the grain boundaries due to the low test temperature. Thus, the results obtained confirm the earlier expressed conception on the tough behaviour of the grain boundaries in quenched steel. Due to the differing behaviour of grain boundaries at low stresses, differing strength values and limit plasticity values are obtained at the instant of failure. The increased intensity of stress relaxation in freshly quenched steel as compared to rested steel cannot be explained by instability of martensite and martensite decomposition under the effect of external stresses. There are 4 figures, 2 tables and 9 references: all Soviet.

SAVINKOV, V.M., prepod.; SHURAKOV, V.V., prepod.; BASAVINA, Ye.V., red.; KUZNETSOVA, L.G., red.

[Programming for the "Minsk-1 electronic digital computer; methodological manual for students of the correspondence section of the department of machine accounting and computing operations] Programmirovanie dlia ETsVM "Minsk-1"; uchebno-metodicheskoe posobie dlia studentov zaochnogo otdeleniia fakul'teta mekhanizatsii ucheta i vychislitel'nykh rabot. Moskva, Vysshaia shkola, 1964. 244 p. (MIRA18:7)

[redacted], V. V.

21754 [redacted], I. P. i [redacted], V. V.

Mekhanicheskaya priroda prochnosti tsementovannoy stali.
V SB: Problemy konstruktsionnoy stali. M.L., 1949, s. 7-22.

SO: Letopis' Zhurnal'nykh Statey, No. 29, Moskva, 1949

SAKHAROV, Aleksandr Borisovich; SHURAKOVA, T.P., red.; BYKOVA, V.V., tekhn.red.

[Industrial safety law in the U.S.S.R.] Ugolovno-pravovaia okhrana bezopasnosti uslovii truda v SSSR. Moskva, Gos.izd-vo iurid.lit-ry, 1958. 184 p. (MIRA 12:2)
(Industrial safety--Law and legislation)

SHURALEV, M.V.; SLAVKIN, B.S., redaktor.

[Methods of dressing surface defects in metal] Metody zachistki poverkhnostnykh defektov metalla. Moskva, Gos. nauchno-tekhn. izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1953. 65 p. (MLRA 7:1)
(Metals--Finishing)

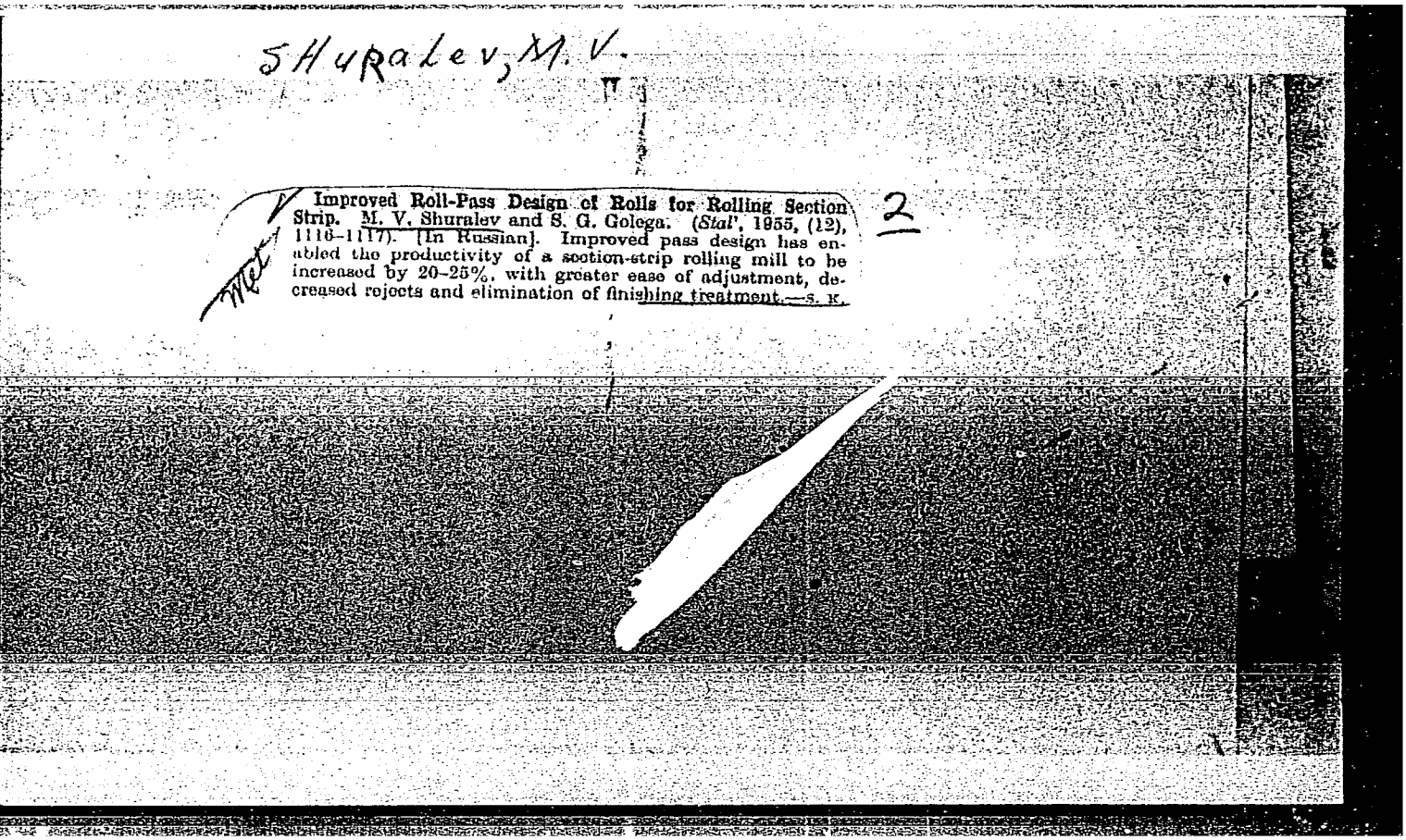
SHURALEV, M. V.

M. V. Shuralev, Metody zachistki poverkhnostnykh defektov metalla /Methods of Cleansing Surface Defects From Metals/, Metallurgizdat, 5 sheets.

The booklet presents basic information on methods of dressing alloyed, and high-alloy steel, gives recommendations for the application of these methods according to the type ofsteel and its intended use, including the characteristics of abrasives, and describes the factors which determine the productivity of abrasive disks. The booklet also describes various types of emery machine tools and other equipment for dressing and trimming steel, and includes rules for the organization of work, and work safety requirements in the dressing departments.

The booklet is intended for emery grinders, steel,trimmers, and dressing brigade leaders and foremen.

SO: U-6172, 12 Nov 1954



Shuralev, M. V.

Improved Roll-Pass Design of Rolls for Rolling Section Strip. M. V. Shuralev and S. G. Golega. (*Stal'*, 1955, (12), 1116–1117). [In Russian]. Improved pass design has enabled the productivity of a section-strip rolling mill to be increased by 20–25%, with greater ease of adjustment, decreased rejects and elimination of finishing treatment.—S. K.

2

SHURALEV, M. V.

18 18 4E2c

Rolling Square-Section Steel with Sharp Edges. M. V. Shuralev and S. G. Nekrasov. (*Stal'*, 1956, (11), 997–999). [In Russian]. Roll-pass designs for rolling squares to produce sharp edges and flat sides is discussed. Separate designs for 8–10 mm and 11–40 mm are recommended. —S. K.

AUTHORS: Shuralev, M.V. and Karyakin, P.I. 133-6-20/33

TITLE: Application of roller passes for rolling large sections. (Primeneniya rolikovykh propuskov pri prokatke krupnykh profiley).

PERIODICAL: "Stal'" (Steel), 1957, No.6, pp.548-549 (USSR).

ABSTRACT: Due to the rapid and non-uniform wear of flat profiles on the above works, they were replaced by roller passes (Figs.1-4). The most suitable steel for rollers was found to be carbon steel 45 (with 0.40-0.50% of C) with hardening in water. For rolling round profiles of 90 m and above, the diameter of rollers used is 100 mm and for profiles 55-85 mm the diameter of rollers is 85 m. The above change improved the quality of rolled products and increased the output by 4 - 6%.

There are 4 figures.

ASSOCIATION: Zlatoust Metallurgical Works. (Zlatoustovskiy Metallurgicheskiy Zavod).

AVAILABLE: Library of Congress

Card 1/1

Shuralev, M.V.

130-9-13/21

AUTHORS: Shuralev, M.V.(Eng.) and Nekrasov, S.G.(Calibration Engineer)

TITLE: Operation of a 600 Mill according to a New Schedule. (Rabota stana 600 po novomu grafiku)

PERIODICAL: Metallurg, 1957, Nr 9, pp.27-28 (USSR)

ABSTRACT: The 600 mm roll diameter mill at the Zlatoustovsk metallurgical works rolls rounds of carbon and alloy steel 90 to 150 mm in diameter from 170 x 170 and 190 x 190 mm square billets weighing 520 to 780 kg. The mill consists of four three-high stands with two continuous furnaces. The rolling schedule and pass designs were recently revised, leading to higher productivity on account of more uniform loading of the stands and working with overlap. The setting and control of the mill was facilitated by the use of separate stands for producing the starting square billets, and separate furnaces were also used for different sizes. An annual economy of about 500,000 roubles has been effected. Pass designs and rolling schedules for the old and revised systems are given. There are 3 figures.

ASSOCIATION: Zlatoust Metallurgical Works (Zlatoustovskiy Metallurgicheskiy Zavod)

AVAILABLE: Library of Congress.

Card 1/1

133-9-10/23

AUTHOR: Pasechnik, V.K., and Shuralev, M.V., Engineers

TITLE: A Modernized Suspended Machine for Dressing Metal. (Modernizirovannyy podvesnoy stanok dlya zachistki metalla)

PERIODICAL: Stal', 1957, No.9, p. 816 (USSR).

ABSTRACT: A machine for dressing metal consisting of a rotating grinding stone which can be pressed to the metal by an adjustable weight is described (figure). Using this machine a 15-20% increase in labour productivity and a 10% decrease in the wear of abrasive stone were obtained.

ASSOCIATION: Zlatoust Metallurgical Works (Zlatoustovskiy Metallurgicheskiy Zavod)

AVAILABLE: Library of Congress.

Card 1/1

Shuralev, M. V.

133-1-15/24

AUTHORS: Shuralev, M.V., and Nekrasov, S.G., Engineers.

TITLE: Determination of Spread during Rolling (Opredeleniye ushireniya pri prokatke)

PERIODICAL: Stal', 1958, No.1, pp. 57 - 60 (USSR).

ABSTRACT: Four methods of calculating spread on rolling (Refs. 1, 2, 3 and 5) were checked by comparing the calculated results with those actually obtained on rolling on three different mills. Characteristic data on mills are given in Table 1 . The experiments were carried out as follows: a) templets were cut off from various strips after passes at the same setting of the rolls; b) the temperature of the strips was determined by an optimal pyrometer; c) transverse dimension of cold templets, perimeters of templets and their cross-sectional areas were measured and d) the spread was also calculated by the above four methods and the determined and calculated results compared. The comparison is given in Table 2. The results obtained by the calculations differed from the experimental results, so that all methods of calculating require some experimentally determined correcting coefficients. Therefore, it would be advantageous to use for practical purposes the most simple formulae, introducing into them the corresponding experimental coefficients. Such formula was obtained by the authors

Card1/2

(Formula 6) based on S.N. Petrov's formula (Ref.6). The formula proposed is suitable for determining spread in roll passes and on a smooth roll. A comparison of results calculated using the above formula with the actual spread (Table 2) indicated that a good agreement was obtained. It is stated in the editorial note that the use of the proposed formula under conditions of other works requires a preliminary experimental check of correcting coefficient m for various passes. There are 2 tables, 1 figure and 6 Russian references.

ASSOCIATION: Zlatoust Metallurgical Works (Zlatoustovskiy metallurgicheskiy zavod)

AVAILABLE: Library of Congress

Card 2/2

SOV/133/58-9-17/29

AUTHORS: Shuralev, M. V., Nekrasov, S. G. (Engineers) and Azarenko, B. S. (Cand.Tech.Sciences)

TITLE: Review of the Book of A. A. Protasov and P. P. Zuyev, "Calibration of Rolls for Rolling High Speed Cutting Steel" Retsenziya na knigu A. A. Protasova i P. P. Zuyeva, "Kalibrovka valkov dlya prokatki bystrorezhushchey stali")

PERIODICAL: Stal', 1958, Nr 9, pp 825-827 (USSR)

ABSTRACT: The book was published by Metallurgizdat in 1956. The review is favourable.

ASSOCIATION: Zlatoustovskiy metallurgicheskiy zavod, MVTU im. Baumana (Zlatoust Metallurgical Works and MVTU im. Bauman)

Card 1/1

SOV/133-59-1-13/23

AUTHORS: Shuralev, M.V. and Nekrasov, S.G.

TITLE: Roll-pass Designing and Rolling of Shaped Profiles from Alloy Steels (Kalibrovka i prokatka fasonnykh profiley iz legirovannoy stali)

PERIODICAL: Stal', 1959, Nr 1, pp 58 - 63 (USSR)

ABSTRACT: Rolling of shaped economical profiles (channel beams PS-102, PS-108 and PS-120) from alloy steels (1Kh18N9T, 30KhGSA and Kh17N2) (Figure 1, Table 1) which are supplied to consumers instead of strip resulted in a 20-30% economy in the consumption of metal and simplified the manufacturing of finished parts. The rolling is done on a three-stand mill 400. Billets are heated in a two-zone continuous furnace with bottom heating. The dimensions of roll passes are given in Tables 2 and 3 and Figures 2 and 4. Some special features of rolling alloy steels are discussed. It is pointed out that for steel 1Kh18N9T the permissible angles of grip are 2-3° lower than for carbon steels which is explained by a higher resistance to deformation of this steel at the rolling temperature. Steels 1Kh18N9T and Kh17N2 are strongly spreading during rolling. Therefore, in designing roll passes for these steels, the limitation of spread should be smaller than

Card1/2

Roll-pass Designing and Rolling of Shaped Profiles from Alloy Steels

for carbon steels. In designing finishing passes an increased shrinkage of alloy steel (particularly 1Kh18N9T) should be taken into consideration. There are 6 figures and 4 tables.

SHURALEV, M.V. ; NEKRASOV, S.G., kalibrovshchik

Change in the grooving of no.4 stamp strips. Metallurg 4 no.3:26-27 Mr '59. (MIRA 12:4)

1. Zamestitel' glavnogo inzhenera Zlatoustovskogo metallurgicheskogo zavod (for Shuralev). 2. Zlatoustovskiy metallurgicheskiy zavod (for Nekrasov).

(Rolling mills)

SHURALEV, M.V.; NEKRASOV, S.G.

Grooving and rolling alloyed steel shapes (with summary in English). Stal' 19 no.1:58-63 Ja '59. (MIRA 12:1)
(Rolling (Metalwork)) (Rolls (Iron mills))

18.5100

78045
SOV/130-60-3-14/23

AUTHORS: Shuralev, M. V., Nekrasov, S. G.

TITLE: Rolling Alloy-Steel Section PS-107A

PERIODICAL: Metallurg, 1960, Nr 3, pp 24-26 (USSR)

ABSTRACT: At Zlatoust Metallurgical Plant (Zlatoustovskiy metallurgicheskiy zavod) a new economical section PS-107A is produced from 1Kh18N9T and EI481 steel (see Fig. 1). The section is rolled in ten passes from a square billet weighing 90 to 100 kg on a 400 mm rolling mill. Billets are preheated in a continuous furnace at following temperature rates: 1Kh18N9T steel, 1,170 to 1,200° C for 40 to 60 min with air cooling; EI481 steel, 1,180 to 1,200° C for 2 hr with air cooling. The section is rolled in one oval and three shaped I-beam passes (see Fig. 2). Round 38 to 40 mm steel is rolled in a square pass 1 (see Fig. 2). Oval pass 2 is a semifinishing pass for 39 to 40 mm round sections. Pass 4 is a semiclosed I-beam-type pass; pass 5, a closed I-beam pass with composite rolls. Both are designed for the

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Rolling Alloy-Steel Section PS-107A

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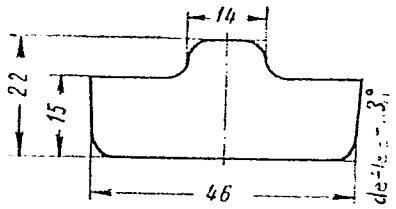

Fig. 1. PS-107A Section

exclusive rolling of PS-107A section. The roll pass design proved expedient with these changes: the roll set of the third stand had to be adjusted to rolling the above section, one groove was added to the bottom roll of the second stand (for pass 3). Experimental and industrial rolling of these economical sections showed decisive factors in producing a properly shaped section to be: (a) shape of the initial square, (b) precision in setting up pass, (c) temperature rates. With temperature drops, a sharp increase in resistance to deformation of both types of steel as well as in metal pressure on the rolls was observed. The authors

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Rolling Alloy-Steel Section PS-107A

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SOV/130-60-3-14/23

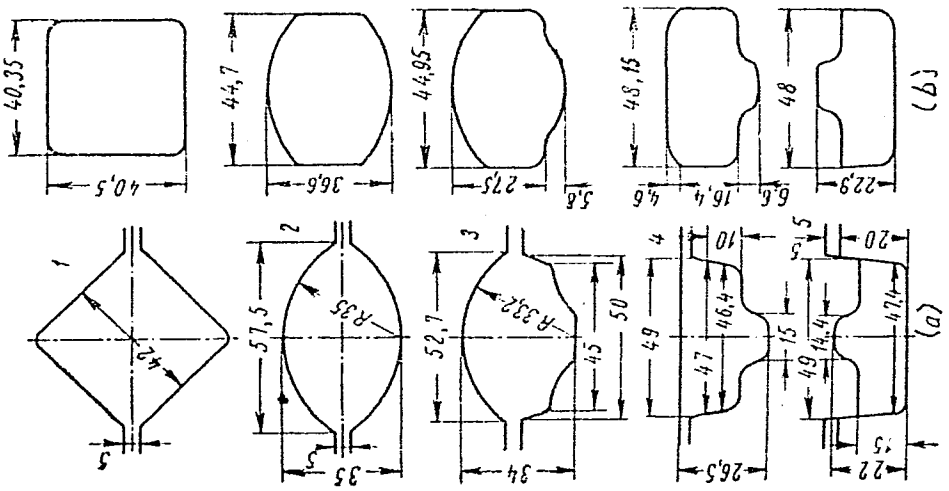

Fig. 2. Roll pass (a) and templet (b) design for PS-107A section.

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recommend rolling at minimum temperatures of 950° C. A fork-shaped repeater installed in a groove prevents collaring. Advantages: (1) 25 to 35% saving of expensive metal wasted by machining, (2) reduced labor by eliminating machining, (3) reduction of roll stock to a minimum, (4) simplification of manufacturing process, (5) saving of time by eliminating roll changing in first and second stands. The convex-shaped top of pass 3 prevents metal flow into the gap between rolls. There are 4 figures and 2 tables.

ASSOCIATION: Zlatoust Metallurgical Plant

S/130/61/000/004/003/005
A006/A001

AUTHORS: Shuralev, M.V., Chief Engineer Deputy, Nekrasov, S.G.

TITLE: Economical Alloyed Steel Sections

PERIODICAL: Metallurg, 1961, No. 4, pp. 21 - 23

TEXT: New economical sections are now being rolled on the three-high 400 mill No. 2 at the Zlatoust Metallurgical Plant (Figure 1). The sections are made of 20ХЗМФ (20Kh3MVF) and 30ХГСА (30KhGSA) alloyed steel. Each section is rolled in 8 passes: passes 1 - 5 on stand No. I; pass 6 on stand II; pass 7 and 8 on stand III (Figure 2). A rectangular strip is used as initial blank for the rolling of shaped sections obtained from a ribbed groove with rounded corners, (Figure 3), so that the initial strip width can be altered during rolling, when switching over from one section to another one, and the filling of closed grooves can be controlled. Each of the 3 sections shown in Figure 4 is shaped in two closed grooves designed for rolling with limited widening. When distributing the grooves on the rolls of stand III it was taken into account that due to the limited widening the strip jams in the closed pass and tends to bind the roll. Therefore the closed passes of the pre-finishing grooves were arranged on the central

Card 1/8

Economical Alloyed Steel Sections

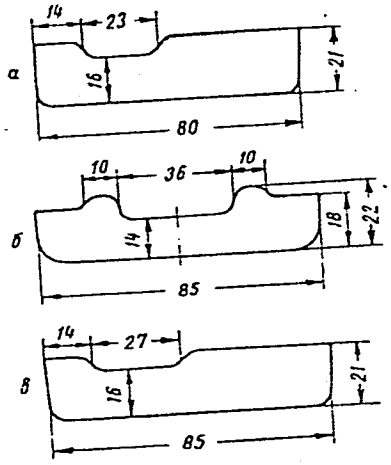
roll and those of finishing grooves on the lower roll. Practice has shown that such an arrangement makes the strip bend downwards. To prevent binding of the rolls, forged steel wires are placed into the closed passes of the lower and central roll. The described arrangement of grooves requires the manufacture of a new set of rolls only for stand III, and the boring of a ribbed groove on the existing rolls of stand III. Roll changing is only necessary for stand II when switching over to the method of economical rolling of sections. To determine the nature of strip deformation and the filling of grooves during the rolling of the strips, templets were taken from strips of the intermediate passes. When rolling section b) (Figure 1) of 20Kh3MVF steel the strip showed lateral bulgings before entering the ribbed groove. The bulging was not fully eliminated during rolling in this groove. When rolling a rectangular strip in the first shaped groove (pass 7), reduction in length of the peaks of sections was observed, caused by the non-uniform compression over the width of the groove: 4.9 mm in the center and 5.6 and 6.6 mm at the edges. The final shaping of peaks is performed in the finishing groove. When rolling sections a) and b) (Figure 1) the filling of the pre-finishing groove with the metal is in agreement with calculations. Data characterizing the rolling of economical sections are presented in the table below. The use of the described sections yields 22% savings of expensive alloyed metal and

S/130/61/000/004/003/005
A006/A001

Economical Alloyed Steel Sections

reduces labor-consuming machining operations when manufacturing machine parts.

Figure 1: Economical sections; a- ГК-01 (GK-01); b - GK-09; c - GK-014



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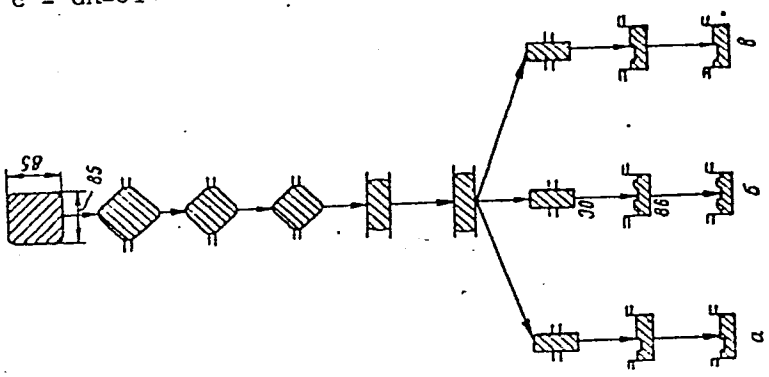
S/130/61/000/004/003/005
A006/A001

Economical Alloyed Steel Sections

Figure 2: Schematic diagram of rolling sections; a - GK-01; b - GK-09; c - GK-014



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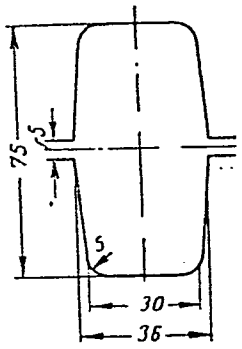
Economical Alloyed Steel Sections

Figure 3: Design of a ribbed groove



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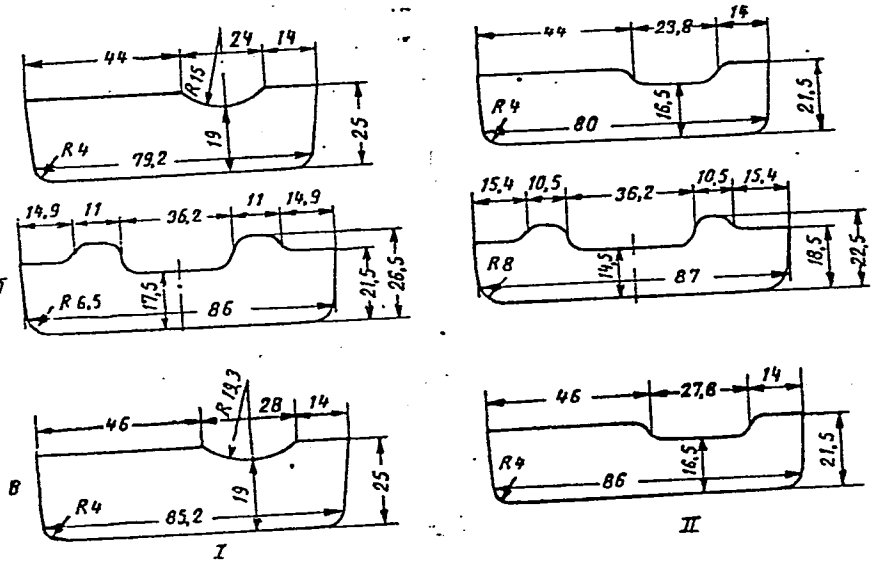
S/130/61/000/004/003/005
A006/A001

Economical Alloyed Steel Sections

Figure 4: Design of grooves for sections a - GK-01; b - GK-09; c - GK-014; 1) pass 7; II) pass 8



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S/130/61/000/004/003/005
A006/A001

Economical Alloyed Steel Sections

Table:

Analysis of calibrating sections GK-01, GK-09 and GK-014

a) Strip dimensions
b) Side of square
c) Cross sectional surface of strip in mm
d) Coefficient of reduction in length
e) Square
f) Smooth
g) Rib
h) Shaped

Клеть Stand	Пропуск Pass	Groove shape Форма калибра	Размеры полосы мм a: высота height	a: ширина width	b: сторона квадрата	c: Площадь поперечного сечения полосы мм²	d: Коэффициент вытяжки	Grip angle Угол захвата degree-min	Section Профиль
		blank Заготовка	—	—	85	7100	—	—	
	1	e Квадрат	—	—	78	3830	1,22	20—40	
I	2	То же	—	—	70	4820	1,21	24—50	
	3	» »	—	—	70	4680	1,03	15—30	
	4	f Гладкий	50	78	—	3650	1,28	19—20	
	5	То же	30	89	—	2550	1,43	18—45	
II	6	g Ребро	77	30	—	2300	1,11	15—30	GK-01 ГК-01
	7	h Фасонный	25	79	—	1880	1,22	13—50	
III	8	То же	21,5	80	—	1600	1,17	7—45	
I	5	Гладкий	30	89	—	2550	1,43	18—45	GK-09 ГК-09
II	6	Ребро	83	30	—	2480	1,03	11—0	
	7	Фасонный	26,5	86	—	1835	1,35	14—45	
III	8	То же	22,5	87	—	1530	1,2	8—20	
I	5	Гладкий	30	89	—	2550	1,43	18—45	GK-014 ГК-014
II	6	Ребро	83	30	—	2480	1,03	11—0	
	7	Фасонный	25	85	—	2030	1,22	13—50	
III	8	То же	21,5	86	—	1700	1,19	7—45	

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S/130/61/000/004/003/005
A006/A001

Economical Alloyed Steel Sections

There are 4 figures and 1 table.

ASSOCIATIONS: Zlatoustovskiy metallurgicheskiy zavod (Zlatoust Metallurgical Plant) (Shuralev); Sibirskiy metallurgicheskiy institut (Siberian Metallurgical Institute) (Nekrasov)

Card 8/8

S/130/61/000/009/003/005
A006/A101

AUTHORS: Shuralev, M. V.; Nekrasov, S. G.; Galega, S. G.

TITLE: The new economical ГК-06 (GK-06) shaped section

PERIODICAL: Metallurg, no. 9, 1961, 23-24

TEXT: A new economical (GK-06) shaped section made of alloyed ЭИ415 (EI415) and 30ХГСА (30KhGSA) steel was assimilated at the Zlatoust Metallurgical Plant. The section is rolled on a medium-grade "400Nr.2" mill which consists of four three-high stands arranged in a line. The 85 mm square blanks are heated in a continuous furnace and rolled into finished sections in 8 passes: the first four passes on stand I, three on stand II and the finishing pass on stand III. The section is shaped in one semi-closed groove with large cutting edges and 3 closed beam-type grooves with constant position of joints. All section grooves were designed for operation with reduced spread thus promoting the precise formation of the shaped section. The closed grooves are placed on the lower rolls since due to the reduced spread the strip may jam in the closed grooves and bind with the roll. The dimensions of the rolling diameter are almost equal in order to prevent excessive increase of the lower roll bead and weakening

Card 1/2

SHIRALEV, M. V.

(40)

PHASE I BOOK EXPLOITATION SOV/6044

Rokotyan, Ye. S., Doctor of Technical Sciences, Ed.

Prokatnoye proizvodstvo; spravochnik (Rolling Industry; Handbook) v. 2. Moscow, Metallurgizdat, 1962. 685 p. 8500 copies printed.

Authors: P. A. Aleksandrov, Doctor of Technical Sciences; V. P. Anisiforov, Candidate of Technical Sciences; V. I. Bayrakov, Candidate of Technical Sciences; M. V. Barbarich, Candidate of Technical Sciences; B. P. Baldtinov, Candidate of Technical Sciences [deceased]; B. A. Bryukhanenko, Candidate of Economic Sciences; M. V. Vasil'chikov, Candidate of Technical Sciences; A. I. Vitkin, Doctor of Technical Sciences; S. P. Granovskiy, Candidate of Technical Sciences; P. I. Grudev, Candidate of Technical Sciences; I. V. Gunin, Engineer; M. Ya. Dzugutov, Candidate of Technical Sciences; V. G. Drozd, Candidate of Technical Sciences; N. F. Yermolayev, Engineer; G. M. Katsnel'son, Candidate of Technical Sciences; M. V. Kovynev, Engineer; M. Ye. Kugayenko, Engineer; N. V. Litovchenko, Candidate of Technical Sciences; Yu. M. Matveyev, Candidate of Technical

Card 1/14

(40)

Rolling Industry; Handbook SOV/6044

Sciences; V. I. Melchko, Candidate of Technical Sciences; N. V. Melkhov, Engineer; A. K. Minburg, Candidate of Technical Sciences; V. D. Nosov, Engineer; B. I. Panchenko, Engineer; O. A. Plyatskovskiy, Candidate of Technical Sciences; I. S. Pobedin, Candidate of Technical Sciences; I. A. Priymak, Professor, Doctor of Technical Sciences [deceased]; A. A. Protasov, Engineer; M. M. Saf'yan, Candidate of Technical Sciences; N. M. Fedosov, Professor; S. N. Filipov, Engineer [deceased]; I. N. Filippov, Candidate of Technical Sciences; I. A. Fomichev, Doctor of Technical Sciences; M. Yu. Shifrin, Candidate of Technical Sciences; E. R. Shor, Candidate of Technical Sciences; M. M. Shternov, Candidate of Technical Sciences; M. V. Shuralev, Engineer; I. A. Yukhvets, Candidate of Technical Sciences; Eds. of Publishing House: V. M. Gorobinchenko, R. M. Golubchik, and V. A. Rymov; Tech. Ed.: L. V. Dobuzhinskaya.

PURPOSE: This handbook is intended for engineering personnel of metallurgical and machine-building plants, scientific research

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(70)

Rolling Industry; Handbook SOV/6044

Institutes, and planning and design organizations. It may also be used by students at schools of higher education.

COVERAGE: Volume 2 of the handbook reviews problems connected with the preparation of metal for rolling, the quality and quality control of rolled products, and designs of roll passes in merchant mills. The following topics are discussed: processes of manufacturing semifinished and finished rolled products (the rolling of blooms, billets, shapes, beams, rails, strips, wire, plates, sheets, and the drawing of steel wire), hot-dipped tin plates, lacquered plates, floor plates, tubes made by different methods, and special types of rolled products. Problems of the organization of rolling operations are reviewed, and types of rolled products manufactured in the USSR are shown. No personalities are mentioned. There are no references.

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Ch. 38. Rolling of Structural Shapes and Merchant Bars (N. M. Fedosov) 162

Ch. 39. Technology and Equipment Used in Rolling Rails and Beams (I. S. Pobedin, And V. G. Drozd) 187

Ch. 40. Rolling of Alloy Steels (M. V. Shuralev) 203
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2. Making finished rolled products 204
3. Special features of processing and treating alloy steels 207
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5. Heat treatment and cooling of rolled products 209

SHURALEV, Mikhail Vasil'yevich; LAPTEV, Lev Semenovich

[Metal stripping worker; cleaning and finishing of ferrous metals] Obdirshchik; obrabotka chernykh metallov. Moskva, Metallurgiia, 1964. 111 p. (MIRA 18:5)

AUTHOR: Shuraleva, Ye. I. 51-3-21/24

TITLE: On the stability of F-centres in NaCl:Ni phosphor. (Ob ustoychivosti F-tsentrov v NaCl-Ni-fosfore).

PERIODICAL: "Optika i Spektroskopiya" (Optics and Spectroscopy), 1957, Vol.2, No.3, pp.396-399 (U.S.S.R.)

ABSTRACT: This paper deals with the NaCl:Ni phosphor with the activator introduced electrolytically at various temperatures (580, 640, 700 and 760 C). For comparison NaCl samples without Ni were prepared under the same conditions (electrolysis at high temperature) and also untreated NaCl samples were used. All samples were excited by 2-hour action of 53 kV X-rays at temperatures of 20, 90 and 130 C. It was found that F-centre and light-sum (total yield) stability was highest in untreated NaCl, lower in electrolysed NaCl and lowest in NaCl:Ni. The higher the concentration of the Ni activator (i.e. the higher the temperature of activation) the lower the F-centre and the light-sum stability. The higher the temperature of X-ray excitation the more stable the F-centres and the light-sums. These effects are explained in terms of defect formation on electrolysis, concentration quenching and recombination processes due to the activator.

Card 1/2

On the stability of F-centres in NaCl:Ni phosphor. (Cont.)
51-3-21/24

There are 3 figures, 1 table and 5 references, 2 of which are Slavic.

SUBMITTED: October 6, 1956.

ASSOCIATION: Physico-Chemical Research Institute, Irkutsk State University. (Fiziko-Khimicheskiy Nauchno-Issledovatel'skiy Institut pri Irkutskom Gosudarstvennom Universitete).

AVAILABLE:

Card 2/2

Shuraleva, Ye. I.

48-4-41/48

SUBJECT: USSR/Luminescence

AUTHOR: Shuraleva Ye. I.

TITLE: On the Stability of F-Centers in NaCl-Ni Phosphor (Ob ustoychivosti F-tsentrov v NaCl-Ni fosfore)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, 1957, Vol 21, #4, pp 591-592 (USSR)

ABSTRACT: Optical and Thermal stabilities of F-centers in NaCl-Ni phosphors excited by X-rays were studied. Comparing these stabilities under various conditions the following results were obtained:

1. F-centers and corresponding light-sums possess the maximum stability in pure NaCl crystals;
2. A preliminary thermal and electric treatment of crystals reduces the stability of these quantities;
3. An introduction of activators accelerates the process of F-centers decay, and the stability of F-centers and corresponding light-sums decreases with an increase in nickel concentration;

Card 1/2

SHURALEVA, Ye. I., Irkutsk University (Irkutskiy Universitet)

"The investigation of the influence of the electric and thermal treatment in the case of pure rock salt crystals"

Report presented at a Conference on Solid Dielectrics and Semiconductors, Tomsk Polytechnical Inst., 3-8 Feb. 58.
(Elektrichestvo, '58, No. 7, 83-86)

68872
S/139/59/000/05/015/026
E201/E191

24.3500

AUTHOR: Shuraleva, Ye.I.

TITLE: Change in the Luminescent Properties of NaCl Crystals due to Electrolytic Activation of Nickel

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, 1959, Nr 5, pp 89-92 (USSR)

ABSTRACT: The author investigated three types of natural NaCl (rocksalt) crystals: (i) untreated, (ii) electrolysed at temperatures from 580-760 °C, and (iii) activated electrolytically with Ni at 580-760 °C. The samples were in the form of identical well-polished plates. They were excited for two hours with X-rays from an RVD-100 tube working at 53 kV and 8 mA. In all the three types of crystals the X-rays produced F-centres, which stored the energy emitted later in afterglow. For each sample the following were measured: the absorption coefficients at the F-band maximum (K_{max}, cm^{-1}), F-centre concentration (N_F, cm^{-3}), the light sum of the ultraviolet luminescence band calculated using Smakula's formula (S), the light sum of the nickel activator luminescence (S_{Ni}), and the temperatures of the thermal de-excitation maxima (T_m). All these properties are

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S/139/59/000/05/015/026
E201/E191

Change in the Luminescent Properties of NaCl Crystals due to Electrolytic Activation of Nickel

given in a table on p 90. The absorption spectra of all the three types of crystals after irradiation with X-rays are given in Fig 1. Fig 2 shows the absorption spectra of NaCl-Ni phosphors not subjected to X-rays. The table on p 90 shows that the action of heating and electrolysis raises the concentration of F-centres and the stored light sum in pure crystals. The rise of the F-centre concentration indicates an increase in the number of ion vacancies with increase of the heat-treatment temperature. The results show also that heat treatment is more important than electrolysis, since the former not only raises the concentration of ionic vacancies but also produces additional luminescence centres. Moreover, heat treatment raises the intensity of the additional absorption produced by X-rays in pure crystals (Fig 1, curves 1 and 2). NaCl-Ni crystals not subjected to X-ray irradiation show new absorption bands at 242 and 350 mμ (Fig 2) even at very low activation temperatures; with increase of the activation temperature the intensity of

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S/139/59/000/05/015/026
E201/E191

Change in the Luminescent Properties of NaCl Crystals due to Electrolytic Activation of Nickel

these absorption bands rises. Presence of the nickel activator in crystals excited with X-rays produces 276 and 308 mμ bands (curve 3 in Fig 1) in the additional absorption spectrum due to X-ray action. The concentration of F-centres in the presence of an activator is higher than in its absence. This concentration rises with increase of the activation temperature and the rise is more rapid than in the case of electrolysis without Ni. Introduction of an activator produces not only its characteristic luminescence but also reduces the intensity of the ultraviolet luminescence band produced by the combination of electrolytic and heat treatment of NaCl crystals. Increase of the activation temperature intensifies the reduction of the intensity of ultraviolet luminescence and raises the magnitude of the "nickel" light sum. The thermal de-excitation curves of NaCl-Ni (Fig 3) show that the orange-red luminescence depends on the amount of the activator, i.e. on the activation temperature.

68877
S/139/59/000/05/022/026
E201/E191

24.7700

AUTHORS: Parfianovich, I.A., and Shuraleva, Ye.I.

TITLE: On the Activator Capture Centres and the Activator Luminescence Centres in Alkali-Halide Phosphors

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, 1959, Nr 5, pp 139-147 (USSR)

ABSTRACT: The authors studied the interaction of electrons and holes with the activator by recording the additional absorption spectra produced by irradiation of alkali-halide phosphors with X-rays. The phosphors were NaCl-Ni and NaCl-Cu, prepared by electrothermal diffusion from rocksalt crystals. The phosphors were irradiated with X-rays from a tungsten-anode tube at room temperature (50 kV, 18 mA). The optical absorption spectra were measured at room temperature with an SF-4 spectrophotometer (Figs 1-9). These spectra showed that some of the activator ions enter the lattice, replacing its cations, while others are distributed at the crystal defects. Some of the ions which enter the lattice are located in the neighbourhood of ion vacancies, forming with the latter various types of electron-capture centres.

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68877
S/139/59/000/05/022/026
E201/E191

On the Activator Capture Centres and the Activator Luminescence Centres in Alkali-Halide Phosphors

The simplest type of such centre is an activator ion next to an anion vacancy. Together with a captured electron this system is known as an atomic centre. The atomic centres of nickel and copper are responsible for the 276 and 290 mμ bands in NaCl-Ni and NaCl-Cu respectively. The activator ions located at the crystal defects form local occlusions and their effect appears only at high activator concentrations. Analysis of the additional absorption bands of NaCl-Cu with large amounts of copper suggested that the 215 mμ band is due to centres consisting of such activator occlusions and of captured electrons. In addition to the electron bands discussed above there are also hole bands due to the acceptor levels of the activator. Since the activator ions themselves cannot act as activators the hole capture levels are produced on interaction of the activator with cation vacancies. The hole bands at 330-340 mμ are in fact produced by centres consisting of activator ions,

Card
2/3

SOV/51-7-4-13/32

AUTHORS: Parfianovich, I.A. and Shuraleva, Ye.I.

TITLE: The Effect of an Activator on the Stability of F-Centres.

PERIODICAL: Optika i spektroskopiya, 1959, Vol 7, Nr 4, pp 518-523 (USSR)

ABSTRACT: Optical decomposition (bleaching) of F-centres in pure NaCl crystals and in NaCl activated at 680-760°C with nickel or copper was studied. Crystals were coloured photochemically at room temperature using X-rays from a tube with a tungsten anode working at 50 kV. Optical measurements were carried out using spectrophotometers SF-4 and SF-2m. Fig 1 shows optical decomposition of F-centres in pure (curve 1), heated (curve 2) and nickel-activated (3×10^{-4} mol.% Ni, cf. curve 3) NaCl crystals. The ordinates represent the relative change in the F-centre concentration and the abscissae show the duration of action of light of 465 mμ wavelength. Fig 1 shows that decomposition of F-centres occurs fastest in the presence of an activator. Stability of F-centres is also lowered, but to a smaller extent, by heating of the crystal. Further measurements on NaCl samples with various amounts of nickel show that the rate of bleaching increases with increase of the activator concentration. Similar effects were observed when NaCl was activated with copper (cf. a table on p 519). In order to elucidate the mechanism of

The Effect of an Activator on the Stability of F-Centres

F-centre decomposition the authors studied changes in the absorption spectra of X-irradiated NaCl (F and M electron bands, V hole band) produced by illumination of pure or activated crystals with 465 mμ, i.e. with the wavelength at which F-band occurred. The results are shown in Figs 2-7 . Analysis of Figs 2-7 shows that the high stability of F-centres in pure crystals is due to formation of predominantly hole centres, with very small effective recombination cross-section, on X-ray irradiation of NaCl. Activation produces favourable conditions for formation of hole centres which do not require additional energy to recombine with electrons at room temperature. The role of the activator as a direct acceptor of electrons is of little importance. The authors reject Oberly's hypothesis (Ref 14) of the existence of two types ("soft" and "hard") of F-centres. The authors ascribe different optical stabilities of F-centres to the external conditions and not to the differences in the nature of F-centres. There are 7 figures, 1 table and 14 references, 1 of which is Soviet, 10 English and 3 German.

SUBMITTED: February 7, 1959

27743
S/058/61/000/007/025/086
A001/A101

24.3500

AUTHOR: Shuraleva, Ye.I.

TITLE: Investigation of optical decay of F-centers in alkali-halide crystals

PERIODICAL: Referativnyy zhurnal. Fizika, no. 7, 1961, 140, abstract 7V305 ("Dokl. Mezhvuz. nauchn. konferentsii po spektroskopii i spektr. analizu". Tomsk, Tomskiy un-t, 1960, 143 - 144)

TEXT: The author studied phenomena of optical flare and photodecay of F-centers in pure and Ni-activated NaCl crystals. It is established that in pure crystals the process of optical decoloration of the F-band is connected with transformation of F-centers into other electron centers. In crystals containing an activator F-centers are less stable; their decay is caused mainly by recombination of electrons escaped from F-levels with ionized luminescence centers. Thus for description of kinetics of F-center decay it is necessary to take into account the presence of various capture centers and their distribution in the phosphor.

[Abstracter's note: Complete translation]

E. Nagayev

Card 1/1

89700

S/139/61/000/001/008/018
E073/E335

24.3500 (1137, 1138, 1163, 1469)

AUTHORS: Parfianovich, I.A. and Shuraleva, Ye.I.

TITLE: Investigation of Details of the Mechanism of Luminescence of NaCl-Ni Phosphors

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, 1961, No. 1, pp. 94 - 97

TEXT: The luminescence of the NaCl-Ni phosphors produced by electrothermal diffusion is generated by means of filtered light from a mercury arc lamp. The brightness of the luminescence will be the higher the greater the activator concentration. The luminescent properties of this phosphor are not stable; with increasing temperature the brightness decreases and in contrast to other crystal phosphors the process is irreversible. Similar changes occur as a result of X-ray irradiation. However, in the latter case, the luminescence does not disappear entirely and this is attributed to the fact that X-ray irradiation does not only destroy existing centres of luminescence but it also creates new ones. Such formation of centres of induced luminescence in NaCl-Ni

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